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EXAMINER	
DAVIS, CYNTHIA L	
ART UNIT	**PAPER NUMBER**
2665	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/787,300	ALESSI ET AL.	
	Examiner	Art Unit	
	Cynthia L Davis	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/6/2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,8-12,18-21,23-37 and 40-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *23-36 and 41* is/are allowed.

6)☒ Claim(s) *1-4, 8-12, 18-22, 37, 40, and 42-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-2 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland and Bang.

Regarding claim 1, a first error control subsystem, coupled to the data sender, comprising a protocol converter that separates incoming network data traffic by QoS requirements is disclosed in Pasternak, column 8, lines 28-29. Adaptively converting each of the separated datastreams into a data link format that is independent of a data sender protocol and is missing from Pasternak. However, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal generic format. It would have been obvious to one skilled in the art at the time of the invention to convert the separated datastreams to a generic format. The motivation would be to connect

networks of different types (see Wakeland, column 2, lines 12-21). The conversion being based on the QoS requirements is disclosed in Pasternak, column 8, lines 28-29 (the packets are divided up in to queues based on QoS, so the conversion is related to the QoS). A first error control module that receives the converted data streams, encodes the datastreams by applying FEC to the datastreams based on the QoS requirements so that data associated with a first QoS requirement is encoded using a first type of FEC encoding scheme and data associated with a second QoS requirement is encoded using a second type of FEC encoding scheme, wherein the first FEC encoding scheme is distinct from the second FEC encoding scheme, and outputs the encoded datastreams to the communications device for transmission over the network is missing from Pasternak. However, Pasternak does disclose using FEC on the various data streams in column 8, lines 11 and 28-29, and transmitting the cells into the network in column 8, line 10 (disclosing radio transmission). Further, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. It would have been obvious to one skilled in the art at the time of the invention to select FEC based on QoS requirements. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19). A second error control subsystem, coupled to the data receiver and a second network, with a second error control module, coupled to the second network, and which receives and decodes the encoded data, is disclosed in Pasternak, column 7, lines 42-46. A second protocol converter that reformats the decoded data into data consistent with the protocol of the second network is disclosed in column 15, lines 31-35.

Regarding claim 2, the second error control module transmitting periodic messages to the first module describing the success or failure of a transmission of data is disclosed in column 10, lines 37-8.

Regarding claim 42, the FEC encoding scheme applied by the first error control module being based on quality of a data link used to transmit the data between the first error control subsystem and the second error control subsystem is missing from Pasternak. However, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. It would have been obvious to one skilled in the art at the time of the invention to select FEC based on QoS requirements of the link. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19).

2. Claims 47, 8, 10-11, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Bang.

Regarding claim 47, determining a QoS requirement for each of a plurality of data packets and identifying a plurality of datastreams, wherein each datastream includes data packets associated with similar QoS requirements is disclosed in Pasternak, column 8, lines 28-29 (disclosing dividing packets into different datastreams based on QoS). Adaptively applying FEC on each of the datastreams, wherein different FEC encoding schemes are applied to different datastreams based on the QoS requirements associated with each datastream is missing from Pasternak. However, Pasternak does disclose using FEC on the various data streams in column 8, lines 11 and 28-29, and transmitting the cells into the network in column 8, line 10 (disclosing

radio transmission). Further, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. It would have been obvious to one skilled in the art at the time of the invention to select FEC based on QoS requirements. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19).

Regarding claim 8, identifying each datastream that comprises quality critical data is disclosed in column 1, lines 51-57 (some service types are considered quality critical, some are not). Applying automatic retransmit protocols to each datastream comprising quality critical data is disclosed in column 8, lines 23-27 (the applications retransmit would only be applied to would be the quality critical ones).

Regarding claim 10, converting the data packets of a selected one of the datastreams from a first data sender protocol to a data link format that is independent of the data sender protocol, wherein the data link format changes as to a generic format, after the identification of QoS levels (line 35, "application specific," different applications have different QoS levels), in order to facility the application of FEC is disclosed in column 15, lines 18-38.

Regarding claim 11, receiving the generically formatted datastream following its transmission over a data link and examining the datastream and reconstructing packets from the datastream into a protocol adapted to the network to which the data link couples is disclosed in column 15, lines 31-35.

Regarding claim 37, the FEC encoding scheme being a Reed-Solomon FEC scheme is disclosed in Pasternak, column 7, lines 19-20.

3. Claims 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland and Bang in further view of Phillips.

Regarding claim 43, the data link format changing as the QoS requirements change is missing from Pasterknak. However, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal generic format. It would have been obvious to one skilled in the art at the time of the invention to convert the separated datastreams to a data link format. The motivation would be to connect networks of different types (see Wakeland, column 2, lines 12-21). Further, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length of the data link format based on QoS. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

Regarding claim 44, the conversion by the first protocol converter being based on the quality of a data link used to transmit the data between the first error control subsystem and the second error control subsystem is missing from Pasternak. However, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal generic format. It would have been obvious to one skilled in the art at the time of the invention to convert the separated datastreams to a data link format. The motivation would be to connect networks of different types (see Wakeland, column 2, lines 12-21). Further, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload

length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length of the data link format based on the quality of the link. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

Regarding claim 45, modifying the payload length of the data based on the QoS requirements is missing from Pasternak. However, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length of the data link format based on the QoS. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

Regarding claim 46, the modification of the payload length by the first protocol converter being based on quality of a data link used to transmit the data between the first error control subsystem and the second error control subsystem is missing from Pasternak. However, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length of the data link format based on the quality of the data link. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland and Bang in further view of Kadambi (6335935).

Regarding claim 3, the method of claim 1 is disclosed in Pasternak. Claim 3 further discloses a data rate converter that allocates available bandwidth for particular communications based upon a weighted priority scheme, which is missing from Pasternak. This is disclosed in Kadambi (6335935), column 31, line 53-column 32, line 6. It would have been obvious to one skilled in the art at the time of the invention to use a weighted priority allocation scheme. The motivation would be to allocate bandwidth efficiently.

Regarding claim 4, the method of claim 3 is disclosed in Pasternak in view of Kadambi. Claim 4 further specifies determining the priority of each communication being sent by the data converter over the network and assigning each communication a weight factor depending upon the priority of each communication and initially allocating bandwidth to a particular communication over a selected date link within the network based on the bandwidth available on that data link for all communications, the weight factor assigned to that particular communication, the quality of the data link or any combination of the foregoing factors, which is missing from Pasternak. However, this is disclosed Kadambi (6335935), column 31, line 53-column 32, line 6. It would have been obvious to one skilled in the art at the time of the invention to use a weighted priority allocation scheme. The motivation would be to allocate bandwidth efficiently.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Bang in further view of Phillips.

Regarding claim 9, adaptively modifying the payload length of packets based on the at least estimated quality of the link over which a particular packet will be

transmitted, or the quality of service associated with the particular packet, or both of these factors, which is missing from Pasternak. However, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

6. Claims 12, 18-20, 40, 48-49, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland, Phillips, and Bang.

Regarding claim 12, Splitting the converted data into multiple datastreams that each have a selected, but different, QoS levels is disclosed in Pasternak, column 1, lines 51-56 (when the data is received by the encoder, it is split into the various QoS levels). A first protocol converter coupled to an application that provides packetized data in a data sender protocol wherein the protocol converter converts the packetized data from the data sender protocol into a data link format that is independent of the data sender protocol is missing from Pasternak. However, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal generic format. It would have been obvious to one skilled in the art at the time of the invention to convert the separated datastreams to a generic format. The motivation would be to connect networks of different types (see Wakeland, column 2, lines 12-21). Adaptively modifying a payload length of the data, wherein the conversion and the modification are adaptive and change as an estimated or measure quality of the data link associated

with each datastream is missing from Pasternak. However, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length. The motivation would be to optimize data throughput (Phillips, column 1, line 67). A first error control module, coupled to the protocol converter, that adaptively encodes the data within each of the multiple datastreams by changing the FEC encoding scheme applied to the datastream as the selected QoS level associated with each datastream changes, so that a first datastream is encoded using a different FEC encoding scheme than a second datastream when the QoS associated with the first datastream differs from the QoS associated with the second datastream is missing from Pasternak. However, Pasternak does disclose using FEC on the various data streams in column 8, lines 11 and 28-29, and transmitting the cells into the network in column 8, line 10 (disclosing radio transmission). Further, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. It would have been obvious to one skilled in the art at the time of the invention to select FEC based on QoS requirements. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19).

Regarding claim 18, separating the datastreams into time and quality critical datastreams is disclosed in column 11, lines 45-49. Coupling to a datalink and forwarding time-critical datastreams directly thereto, and forwarding quality critical data to a retransmission module that monitors transmission of the quality critical data and

retransmits said data based on at least one parameter is disclosed in Pasternak, column 8, lines 23-27 (the applications retransmit would be applied to would be the quality critical ones, time-critical applications would not be retransmitted).

Regarding claim 19, the at least one parameter being independent of any estimate of the round trip time necessary for the transmission to reach its destination and for the error control module thereafter to receive an acknowledgment is disclosed in Pasternak, column 8, lines 23-27 (there is no mention here of round trip time, merely that some applications may require retransmission, hence, retransmission is based upon application, not round trip time).

Regarding claim 20, adaptively converting the packetized data in the second data sender protocol into the data link format, wherein the data link format is independent of the second data sender protocol. Concatenating the data from the second protocol with the converted data from the first protocol converter into the multiple data streams is not specifically disclosed in Pasternak. However, the converter of column 15, lines 31-37 could convert the packetized data into a generic format and concatenate it with the other data ("whatever format the carrier network requires"). Further, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal data link format. It would have been obvious to one skilled in the art at the time of the invention to convert the various data into a data link format and concatenate it. The motivation would be to connect networks of different types (see Wakeland, column 2, lines 12-21).

Regarding claim 40, the FEC encoding scheme being a Reed-Solomon FEC scheme is disclosed in Pasternak, column 7, lines 19-20.

Regarding claim 48, the first error control subsystem receiving periodic control messages from second error control module describing a successful or unsuccessful data transmission is disclosed in Pasternak, column 8, lines 23-25 (disclosing a retransmission controller, which would receive information regarding successful or unsuccessful retransmission).

Regarding claim 49, the first error control subsystem receiving data from a second error control module from which to measure or estimate a quality of a data link between the first control module and the second control module is disclosed in Pasternak, column 8, lines 23-25 (disclosing a retransmission controller, which would receive information regarding the quality of the link).

Regarding claim 52, the first error control module modifies a length of the FEC applied to the datastreams after changing the FEC encoding scheme as the estimated or measured quality of the data link changes is missing from Pasternak. However, Pasternak does disclose using FEC on the various data streams in column 8, lines 11 and 28-29, and transmitting the cells into the network in column 8, line 10 (disclosing radio transmission). Further, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. Also, Bang discloses in column 1, lines 5-9, use of variable length codes in an error prone channel. It would have been obvious to one skilled in the art at the time of the invention to select FEC and vary the length based on link quality. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19).

1. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland, Phillips, and Bang in further view of Kadambi.

Regarding claim 21, a data rate converter that allocates available bandwidth for available bit rate transmissions based upon a weighted-priority scheme, which is missing from Pasternak. However, this is disclosed Kadambi (6335935), column 31, line 53-column 32, line 6. It would have been obvious to one skilled in the art at the time of the invention to use a weighted priority allocation scheme. The motivation would be to allocate bandwidth efficiently.

7. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland and Phillips.

Regarding claim 50, determining the QoS requirement for each of a plurality of data packets and identifying a plurality of datastreams, wherein each datastream includes data packets associated with similar QoS requirements is disclosed in Pasternak, column 8, lines 28-29 (disclosing dividing packets into different datastreams based on QoS). Adaptively converting the data packets associated with a selected datastream from a first data sender protocol into a data link format that is independent of the data sender protocol is missing from Pasternak. However, Wakeland discloses in column 2, lines 2-3, a switch that converts packets to an internal generic format. It would have been obvious to one skilled in the art at the time of the invention to convert the separated datastreams to a data link format. The motivation would be to connect networks of different types (see Wakeland, column 2, lines 12-21). Adaptively modifying a payload length of the data packets within the selected datastream, wherein

the conversion and the payload modification change as the QoS requirement associated with the datastream changes is missing from Pasternak. However, Phillips discloses in column 1, lines 39-44, a system that adaptively adjusts packet length depending on the error rates (adjusting the payload length is a way of adjusting the packet length). It would have been obvious to one skilled in the art at the time of the invention to adaptively adjust the payload length of the data link format based on the QoS. The motivation would be to optimize data throughput (Phillips, column 1, line 67).

8. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternak in view of Wakeland and Phillips in further view of Bang.

Regarding claim 51, adaptively applying FEC on the selected datastream, wherein different FEC encoding schemes are applied to different datastreams based on the QoS requirements associated with each datastream is missing from Pasternak. However, Pasternak does disclose using FEC on the various data streams in column 8, lines 11 and 28-29, and transmitting the cells into the network in column 8, line 10 (disclosing radio transmission). Further, Bang discloses in column 12-19 a relationship between allowable delay (or QoS) and type of FEC technique. It would have been obvious to one skilled in the art at the time of the invention to select FEC based on QoS requirements. The motivation would be to use the best method suited to the allowable bit error rate (Bang, column 2, lines 12-19).

Allowable Subject Matter

2. Claims 23-36 and 41 are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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